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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,123	03/31/2004	Gary W. Atkinson	Atkinson 3-1-28	9196

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EXAMINER	
MERED, HABTE	

ART UNIT	PAPER NUMBER
2616	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/815,123	ATKINSON ET AL.	
	Examiner	Art Unit	
	HABTE MERED	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,10-13,19 and 20* is/are rejected.

7)☒ Claim(s) *5-9 and 14-18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *see attached*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment entered on 4/16/2008 has been entered and fully considered.

2. Claims 1-20 are pending. Claims 1 and 10 are the base independent claims. Dependent claims 3, 9, 12, and 18 are amended. Dependent claims 19 and 20 are new.

Response to Arguments

3. Applicant's arguments, see Remarks, filed on 4/16/2008 with respect to the rejection(s) of claim(s) 1-18 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Austin et al (Gary P. Austin, Bharat T. Doshi, Christopher J. Hunt, Ramesh Nagarajan, and M. Akber Quershi, "Fast, Scalable, and Distributed Restoration in General Mesh Optical Networks", Bell Labs Technical Journal, Jan/Jun 2001) and Miyao et al (Yasushiro Miyao and Hiroyuki Saito, "Optimal Design and Evaluation of Survivable WDM Transport Networks", IEEE, 1998).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1 and 10** are rejected under 35 U.S.C. 102(b) as being anticipated by Austin et al (Gary P. Austin, Bharat T. Doshi, Christopher J. Hunt, Ramesh Nagarajan,

and M. Akber Quershi, "Fast, Scalable, and Distributed Restoration in General Mesh Optical Networks", Bell Labs Technical Journal, Jan/Jun 2001).

Regarding **claim 1**, Austin discloses a method, comprising:

receiving one or more demands for service in a mesh network **(i.e. see Figure 4)**, which network comprises a plurality of nodes interconnected by a plurality of links **(Austin shows on page 68, 2nd column, 1st paragraph, 1st sentence clearly states that the entire paper is based on mesh-based optical network)**;

and mapping each of the one or more demands **(i.e. traffic requirement or request)** onto a primary path and a restoration path **(i.e. alternate routes)** in the network to generate at least one path plan for the one or more demands in the network, wherein the at least one path plan **(i.e. a path plan contains a selected primary and alternate routes)** is generated as a function of **(i.e. see page 69, 2nd paragraph last sentence indicating the primary path is selected based on a minimum network capacity cost and a restoration path is also selected to complement the primary path. Austin further shows on page 70, 1st column, in the 1st and 3rd paragraph how a restoration path that is disjoint from the primary path is selected.)**

(a) one or more cost criteria **(i.e. resource contention and capacity)** associated with the at least one path plan **(i.e. see page 69, 1st Column, Lines 28-33 the primary path cost is capacity minimized and on page 74 minimizing cost of resource contention on the primary path as seen on page 74, 1st column, 2nd paragraph)** and

(b) a failure-related cross-connection criterion associated with the path plan **(i.e. on page 69, 1st column, lines 7-11 indicates minimum restoration time and capacity on the restoration path and as indicated on page 71, 1st column, Lines 16-22 that the number of cross connection at a node impacts the restoration time needs to be bounded as shown in Tables I and II)**.

Regarding **claim 10**, Austin discloses a path manager **(i.e. Network design tools such as INDT and SPIDER as indicated on page 69, 1st column, 2nd paragraph)** for a mesh communications network **(i.e. see Figure 4)**, the manager comprising one or more computing elements, wherein the manager is adopted to:

receive one or more demands for service in a mesh network **(i.e. see Figure 4)**, which network comprises a plurality of nodes interconnected by a plurality of links **(Austin shows on page 68, 2nd column, 1st paragraph, 1st sentence clearly states that the entire paper is based on mesh-based optical network)**;

and map each of the one or more demands **(i.e. traffic requirement or request)** onto a primary path and a restoration path **(i.e. alternate routes)** in the network to generate at least one path plan for the one or more demands in the network, wherein the at least one path plan **(i.e. a path plan contains a selected primary and alternate routes)** is generated as a function of **(i.e. see page 69, 2nd paragraph last sentence indicating the primary path is selected based on a minimum network capacity cost and a restoration path is also selected to complement the primary path. Austin further shows on page 70, 1st column, in the 1st and 3rd paragraph how a restoration path that is disjoint from the primary path is selected.)**

(a) one or more cost criteria **(i.e. resource contention and capacity)** associated with the at least one path plan **(i.e. see page 69, 1st Column, Lines 28-33 the primary path cost is capacity minimized and on page 74 minimizing cost of resource contention on the primary path as seen on page 74, 1st column, 2nd paragraph)** and

(b) a failure-related cross-connection criterion associated with the path plan **(i.e. on page 69, 1st column, lines 7-11 indicates minimum restoration time and capacity on the restoration path and as indicated on page 71, 1st column, Lines 16-22 that the number of cross connection at a node impacts the restoration time needs to be bounded as shown in Tables I and II)**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 2-4, 11-13, 19, and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Austin in view of Miyao et al (Yasushiro Miyao and Hiroyuki Saito, "Optimal Design and Evaluation of Survivable WDM Transport Networks", IEEE, 1998).

Regarding **claim 2**, Austin fails to disclose a method wherein the at least one path plan is generated by:

calculating a first set of one or more path plans that satisfy the one or more cost criteria;

calculating a second set of one or more path plans that satisfy the failure-related cross-connection criterion; determining whether the first and second sets have any path plans in common;

and if not, then, until the first and second sets have at least one path plan in common, relaxing the one or more cost criteria and recalculating the first set.

However, the above mentioned claimed limitations are well known in the art as evidenced by Miyao. In particular, Miyao discloses a method **(see abstract on page 1190)** wherein the at least one path plan is generated by:

calculating a first set of one or more path plans that satisfy the one or more cost criteria **(i.e. on page 1190, 2nd column, Lines 2-5 and 15-25 that paths are selected to minimize capacity or facility cost as shown in equation 1 on page 1193)**;

calculating a second set of one or more path plans that satisfy the failure-related cross-connection criterion **(i.e. See Section C. Cost Model last paragraph indicating a guideline for the number of cross-connections at a node. On page 1193, 2nd Column in Lines 12-30 Miyao discloses for each path that satisfy 100% restoration for any single span failure (see Section III 1st paragraph) it determines the maximum available number of optical cross-connects (OXCs), En and a variable e_n at each node that needs to be less than En as specified in Equation 8 on page 1194)**;

determining whether the first and second sets have any path plans in common **(i.e. the final selection of the path has to meet equation 4 on page 1194. Equation**

4 minimizes for the capacity cost and then the total cross-connect on the node and only the path that satisfies this condition is selected);

and if not, then, until the first and second sets have at least one path plan in common, relaxing **(i.e. the relaxation occurs because variable parameters are used to meet network condition as seen on page 1193, 2nd column, lines 49-56)** the one or more cost criteria **(i.e. capacity cost of each path as indicated on page 1193, 2nd, line 49)** and recalculating **(i.e. since it is a design tool it is reiteratively done till Equation 4 is satisfied)** the first set **(also please see Lines 1-7, 1st column of page 1198 clearly indicates that Miyao calculates a first set of working/primary path and a second set of restoration path that minimizes capacity and minimizes cross connection at every node and picks a primary/working and restoration disjoint path)**.

In view of the above, having the method of Austin and then given the well established teaching of Miyao, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the method of Austin as taught by Miyao, since Miyao clearly states in Lines 3-6 that such a modification results in capacity assignment being determined so as to minimize total facility cost subject to demand being satisfied both in normal and failure states.

Regarding **claim 3**, the combination of Austin and Miyao disclose a method wherein the failure-related cross-connection criterion specifies a maximum number of cross-connections **(i.e. En)** that are changed in any node in the network following a failure in the network **(i.e. see page 1193, 2nd column, Lines 29-31 showing En being**

the max allowable number of Optical =Cross Connect at a node, i.e. En), wherein a path plan **(i.e. Equations 4 and 11)** does not satisfy the failure related cross-connection that are changed in any node in the path plan following a failure in the network exceeds the specified maximum number **(i.e. if e_n exceeds En when implementing the restoration path then the plan specified by equations 4 and 11 will not be met)**.

Regarding **claim 4**, the combination of Austin and Miyao disclose a method wherein the one or more cost criteria are a function of at least one of sharing degree, administrative weight, link utilization, and available capacity. **(For both Austin and Miyao the cost criterion is a function of capacity. See Austin see page 69, 2nd paragraph last sentence indicating the primary path is selected based on a minimum network capacity cost and Miyao on page 1190, 2nd column, Lines 2-5 and 15-25 shows that paths are selected to minimize capacity or facility cost as further shown in equation 1 on page 1193)**.

Regarding **claim 19**, Austin fails to disclose a method wherein the failure-related cross-connection criterion specifies a maximum number of cross-connections that are changed in any node in the network following a failure in the network, wherein a path plan does not satisfy the failure related cross-connection that are changed in any node in the path plan following a failure in the network exceeds the specified maximum number.

However, the above mentioned claimed limitations are well known in the art as evidenced by Miyao. In particular, Miyao discloses a method wherein the failure-related cross-connection criterion specifies a maximum number of cross-connections **(i.e. En)**

that are changed in any node in the network following a failure in the network **(i.e. see page 1193, 2nd column, Lines 29-31 showing En being the max allowable number of Optical =Cross Connect at a node, i.e. En)**, wherein a path plan **(i.e. Equations 4 and 11)** does not satisfy the failure related cross-connection that are changed in any node in the path plan following a failure in the network exceeds the specified maximum number **(i.e. if e_n exceeds En when implementing the restoration path then the plan specified by equations 4 and 11 will not be met).**

In view of the above, having the method of Austin and then given the well established teaching of Miyao, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the method of Austin as taught by Miyao, since Miyao clearly states in Lines 3-6 that such a modification results in capacity assignment being determined so as to minimize total facility cost subject to demand being satisfied both in normal and failure states.

Regarding **claim 11**, it is noted that the limitations of claim 11 corresponds to that of claim 2 as discussed above, please see the Examiner's comments with respect to claim 2 as set forth in the rejection above.

Regarding **claim 12**, it is noted that the limitations of claim 12 corresponds to that of claim 3 as discussed above, please see the Examiner's comments with respect to claim 3 as set forth in the rejection above.

Regarding **claim 13**, it is noted that the limitations of claim 13 corresponds to that of claim 4 as discussed above, please see the Examiner's comments with respect to claim 4 as set forth in the rejection above.

Regarding **claim 20**, it is noted that the limitations of claim 20 corresponds to that of claim 19 as discussed above, please see the Examiner's comments with respect to claim 19 as set forth in the rejection above.

Allowable Subject Matter

7. **Claims 5-9 and 14-18** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 5-9 as well as claims 14-18 contain allowable subject matter since all of the cited references in the prior art of record taken individually or in combination fail to particularly teach or suggest a method and path manager capable of generating at least one path by executing the following steps of

a) calculating a set of node-disjoint path pairs for the one or more demands based on the failure-related cross-connection criterion, wherein a node-disjoint path pair is calculated for each demand;

(b) identifying primary and restoration paths for each node-disjoint path pair in the set to generate a path plan for the one or more demands;

(c) determining whether the path plan satisfies the failure-related cross-connection criterion;

(d) saving, when the path plan satisfies the failure-related cross-connection criterion, the path plan;

(e) repeating steps (a)-(d) to generate two or more path plans that satisfy the failure-related cross-connection criterion; and

(f) selecting one of the path plans based on the one or more cost criteria.

Conclusion

8. Examiner would like to stress that both Austin and Miyao can be used to reject the broad independent claims 1 and 10 under 35 U.S.C. 102(b).

Further, it should be very clear that both Austin and Miyao teach the concept of failure related cross connection criterion associated with the path plan as detailed in the rejections provided above.

Miyao is also a very strong reference in that like the Applicant it teaches determining the number of cross connects when selecting a path so as to not exceed a maximum limit, En. However, Miyao differs from the Applicant in that when it selects the set of working and restoration path in that it minimizes the facility/capacity cost as well as minimizing the number of cross connections simultaneously while the Applicant does it in two steps wherein first cost minimization is done followed by minimization of the cross connection at a node. Hence Examiner strongly recommends Applicant clearly amend all pertinent claims including objected claims to over come the teachings of Miyao.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HABTE MERED whose telephone number is (571)272-6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Aung S. Moe can be reached on 571 272 7314. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Habte Mered/
Examiner, Art Unit 2616

7-24-2008

/Aung S. Moe/
Supervisory Patent Examiner, Art Unit 2616